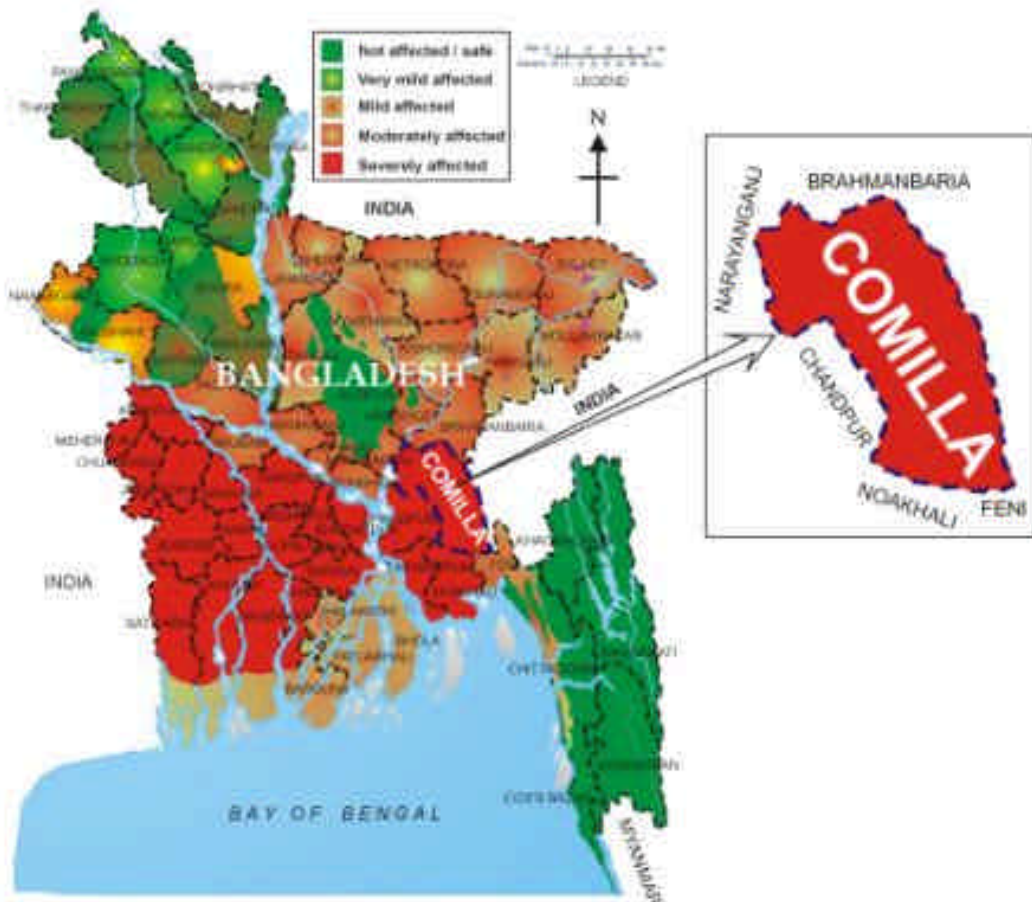


**Many million dollar projects for arsenic issue  
in Bangladesh: For Eruani village of Laksam  
Police Station under Comilla district,  
the condition deteriorated from 1998 To 2004**



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**School of Environmental Studies**

**Jadavpur University  
Kolkata - 700 032, India**

Tel: 91 33 24146233 / 24146760

Fax: 91 33 24146266

E-mail: [dcsoesju@vsnl.com](mailto:dcsoesju@vsnl.com)

Website: [www.soesju.org](http://www.soesju.org)

**Dhaka Community Hospital**

**190/1, Baro Maghbazar,  
Wireless Railgate**

**Dhaka-1217, Bangladesh.**

Tel: 880-2-9351190-1

Fax: 880-2-9338706

E-mail: [dch@bangla.net](mailto:dch@bangla.net)

Website: [www.dchtrust.org](http://www.dchtrust.org)

Dhaka Community Hospital (DCH) jointly with School of Environmental Studies, Jadavpur University, Kolkata first reported the arsenic problem of Eruani village during the international conference, “Groundwater arsenic problem in Bangladesh: causes, effects and remedies”, 6-9 February 1998, Dhaka, Bangladesh (Ref.1). During this conference, national and international participants visited the Chandipur village, P.S. Ramganj, Dist. Lakshmipur to get an experience about arsenic situation in Bangladesh. **Table-1** shows the arsenic contamination situation and health effect in Chandipur village studied in 1998 during and after the conference. **At the end of the conference it was declared in Dhaka Declaration, “there should be no village like Chandipur suffering from arsenic toxicity in Bangladesh”.**

**Table-1: Arsenic situation in Chandipur village (1998)**

Area in sq.km	7.2
Population	7429
Total number of hand tubewells	700
Number of hand-tubewells water samples analyzed	628
Number of samples having arsenic >10 µg/L	537(85.5%)
Number of samples having arsenic >50 µg/L	464(73.9%)
Number of people screened for arsenical skin lesions (preliminary survey)	970
Number of registered patients with clinical manifestations	252(26%)
Number of the children having arsenical skin lesions	11(6%)
Total hair, nail and urine samples analyzed	470
Arsenic above normal level (average) in hair, nail and urine samples	93%

### **Arsenic situation as we reported in Eruani village during February 2000**

We reported the grave arsenic contamination situation, suffering of children from arsenic toxicity, pregnant woman drinking arsenic contaminated water in Eruani village in our report, “Groundwater arsenic contamination in Bangladesh: (A) Summary of 239 days field survey from August 1995 to February 2000 (B) Twenty seven days detailed

field survey information from April 1999 to February 2000” published in April 2000 (Ref.2). We wrote in that report,

“Comilla district’s Eruani village of PS Laksam was surveyed. Eruani is a very big village. It has 5 parts: Madhyapara, Purbapara, Paschimpara, Uttarpada and Dakshinpara. We could survey only Madhyapara and for a while Paschimpara. Normally, we do not find arsenical skin lesions in children unless the arsenic concentration in drinking water is quite high (around 0.75 mg/l and above) or the nutrition status is very poor, in which case a moderate arsenic concentration of around 0.5 mg/l can cause skin lesions in children. But in some villages of Bangladesh also in Madhyapara of Eruani village we have found children like Tahamina (F/8), Pravin (F/11) and Saiful (M/10) have arsenical skin lesions. All the children in Photograph-56 (photograph is in Ref. 2) of Eruani village have elevated level of arsenic in hair; nail and a few have arsenical skin lesions.

Paschimpara of Eruani is highly affected too. Here children are also affected – like Hasina (F/10), Nargis (F/8) (Photograph-57 in Ref.2).

Even a pregnant woman, Phulnar (F/23), who has arsenical skin lesions, also drinks, contaminated water (Photograph-58 in Ref.2). However, the worse arsenic affected man of the village is Ohidur Rahaman (M/30). He has severe keratosis (Photograph-59 in Ref.2).

Village Eruani needs a detailed survey to know the magnitude of the calamity.”

**Arsenic groundwater contamination and sufferings of people in Eruani village of Laksam police station under Comilla district studied on 16<sup>th</sup> February 2004, during 5<sup>th</sup> International Conference on “Arsenic: Developing Countries Perspective on Health, Water & Environmental Issues” in Dhaka, Bangladesh.**

On 16<sup>th</sup> February 2004 during 5<sup>th</sup> International Conference on “Arsenic: Developing Countries Perspective on Health, Water & Environmental Issues” in Dhaka, Bangladesh the medical groups of Dhaka Community Hospital-Bangladesh and School of Environmental Studies, Jadavpur University-India surveyed the Madhyapara of Eruani village in Laksam PS. of Comilla district again after four years.

Eruani is a big village in Lakshmi police station of Comilla district. The village has 5 parts named Madhyapara, Purbapara, Paschimpara, Uttarpara and Dakshinpara. Total population is about 7500. 16<sup>th</sup> February was a day of Hartal in all over Bangladesh, so, we left Dhaka at 3:00 am for Eruani village and reached at about 6.30 am. We could recognize many patients we had seen during our December 1998 and February 2000 surveys. Some of them died, many of them are in serious condition (Abdul Karim M/45; Suspected cancer; Ohidur Rahaman, M/40; suspected multiple Bowen’s). We could survey only Madhyapara until it was dark. **Table-2** shows some findings in Madhya para.

**Table-2. Some findings of our survey in Madhyapara of Eruani village**

Total population of Madhayapara	2500
Total population screened by our medical team	700
Number of patients identified with skin lesions	210 (30%)
Number of children examined age upto 11 years	84
Number of children identified with arsenical skin lesions	8 (9.52%)*
Death incidents to those who had arsenical skin lesions (we have name and address)	17
Number patients identified with suspected Bowens	21
Number patients identified with suspected cancer	2

\* During our last survey in Feb 2000 these children had no arsenical skin lesions.



**Photograph-1** shows a child patient with arsenical skin lesions.



**Photograph-2** shows a patient with suspected cancer



**Photograph-3** shows a serious arsenic patient with suspected multiple Bowen's.

## Present arsenic contamination status in Madhyapara of Eruani village.

### Water analysis

**Table-3: Hand tube-well water analysis report of Madhya Para, Eruani village.**

Total no. of water samples analyzed from Madhya Para, Eruani village	97
No. of samples contain arsenic <10 µg/L	3
No. of samples contain arsenic >10 µg/L	94
No. of samples contain arsenic >50 µg/L	92
No. of samples contain arsenic ranges from 10–50 µg/L	2
No. of samples contain arsenic ranges from 51–99 µg/L	1
No. of samples contain arsenic ranges from 100–299 µg/L	11
No. of samples contain arsenic ranges from 300–499 µg/L	20
No. of samples contain arsenic ranges from 500–699 µg/L	19
No. of samples contain arsenic ranges from 700–1000 µg/L	17
No. of samples contain arsenic >1000 µg/L	24

During last 17 years work in arsenic affected villages we have seen a few villages as affected as Madhyapara of Eruani village.

From **Table-3** it appears only 3 samples have arsenic less than 10 µg/L and 2 hand tubewells between 10 and 50 µg/L. Total population of this village is 2500. While discussing with the villagers we came to know that many villagers drink water from their own tubewells although they are aware about the possible arsenic contamination of their hand tubewells. The reason they cited in favor of drinking contaminated water was that they had no other alternative water sources except a dugwell, which was not enough even for a few families. There also exist an arsenic contamination free deep tubewell but they were reluctant to collect that water because it is far away from their home and always remain over crowded. We felt they are also not regarding their arsenic problem so seriously.

### **Arsenic in urine samples of 200 patients who have arsenical skin lesions.**

We expected 6 years after discovering of arsenic in Eruani village, patients with arsenical skin lesions would at least drink safe water and urinary arsenic is expected to be slightly higher than the normal limit. But urine analysis results show (**Table-4**) most of the patients had high concentration of arsenic in urine and of recent exposure. Even in the urine of patients of our newly discovered arsenic affected villages in Bihar, UP, Jharkhand-India, arsenic in urine is comparable to those of the patients of Eruani village where arsenic contamination was discovered 6 years ago and patients are expected to drink arsenic safe water.

**Table-4: Analyses of arsenic (arsenic metabolites) in urine samples collected from 200 patients with arsenical skin lesions**

Total no. of urine* samples analyzed from Madhya Para of Eruani	200
No of sample contain arsenic less than 40 µg/1.5 L	Nil
No. of samples contain arsenic ranges from 45–199 µg/1.5 L	54
No. of samples contain arsenic ranges from 200–399 µg/1.5 L	73
No. of samples contain arsenic ranges from 400–599 µg/1.5 L	32
No. of samples contain arsenic ranges from 600–799 µg/1.5 L	18
No. of samples contain arsenic ranges from 800–1000 µg/1.5 L	7
No. of samples contain arsenic >1000 µg/1.5 L	16
No. of samples contain arsenic >2000 µg/1.5 L	10
No. of samples contain arsenic >3000 µg/1.5 L	2
No. of samples contain arsenic >4000 µg/1.5 L	2

\* Normal level of arsenic in urine is 5-40 µg/1.5 L/day.

### **Arsenic in nail of 122 patients who have arsenical skin lesions**

Normally, if arsenic patients discontinue arsenic ingestion, arsenic in hair, nail and urine comes to normal level gradually. For urine it takes around 4-5 days and for hair and nail it may take a few years (depends on arsenic burden). **Table-5** shows arsenic in nail of the arsenic patients of Eruani village.

Results of arsenic in nail indicate most of the arsenic patient's arsenic exposure has been continuing.

**Table-5: Analyses of arsenic in nail samples collected from 122 patients with arsenical skin lesions**

Total no. of nail* samples analyzed from Madhya Para of Eruani	122
No of samples contain arsenic less than normal level*	Nil
No. of samples contain arsenic ranges from 1081-3240 $\mu\text{g}/\text{kg}$	38 (32.2%)
No. of samples contain arsenic ranges from 3240-5400 $\mu\text{g}/\text{kg}$	34 (27.9%)
No. of samples contain arsenic ranges from 5401-7560 $\mu\text{g}/\text{kg}$	20 (16.4%)
No. of samples contain arsenic ranges from 7561-9720 $\mu\text{g}/\text{kg}$	8 (6.6%)
No. of samples contain arsenic ranges from 9721-11880 $\mu\text{g}/\text{kg}$	12 (9.8%)
No. of samples contain arsenic ranges from 11881-14040 $\mu\text{g}/\text{kg}$	7 (5.7%)
No. of samples contain arsenic ranges from 14041-16200 $\mu\text{g}/\text{kg}$	Nil
No. of samples contain arsenic >16200 $\mu\text{g}/\text{kg}$	1 (0.8%)

\* Normal level of arsenic in nails ranges from 430-1080  $\mu\text{g}/\text{kg}$

### **Arsenic neuropathy patients in Eruani village**

According to Prof. S.C. Mukherjee (Professor and Head, Department of Neurology, Medical College), "I have been working on arsenic neuropathy in arsenic affected villages of West Bengal, Bihar, Uttar Pradesh and Jharkhand for last 7 years, but to me Eruani villagers are most affected from arsenic neuropathy. On discontinuation of arsenic contaminated water the arsenic neuropathy reduces substantially. It appears to me after studying arsenic neuropathy in Eruani village that the villagers are still exposed to high arsenic contaminated water. Out of 166 patients of arsenicosis neurologically examined, 100 (60.3%) patients revealed evidence of arsenic neuropathy. There were 4 children below 15 years including a 9 year child who were affected with arsenic neuropathy."

## Finally:

At least 100 million dollars spent for arsenic issue in Bangladesh. But for Eruani village the condition has *(been)* deteriorated from 1998 to 2004.



**Photograph-4** shows 2 sisters and both have arsenical skin lesions. Their father and mother died from ascites and had severe arsenical skin lesions. In their family there are 17 members and most of them have arsenical skin lesions.

New generation is getting skin lesions.

## WHAT IS OUR FIRST PRIORITY- ARSENIC RESEARCH OR ARSENIC SAFE WATER FOR VILLAGERS?

**On 17<sup>th</sup> February 2004 during the conference, the present grave arsenic situation of Eruani village was highlighted and also as ritual Dhaka Declaration was read.**

## How to save Eruani village people:

- 1 Make villagers aware about the danger of arsenic toxicity through awareness campaign.
- 2 A few tubewells (shallow or deep), which are now safe in the village, are to be used by villagers for drinking and cooking and after every three months these tubewells are to be monitored for arsenic.
- 3 A few big diameter dugwells are needed provided these are well maintained and kept free from bacteria.
- 4 Immediately a few deep tubewells, more than 800 ft are to be installed and only to be used for drinking and cooking with regular monitoring. Our study shows on the basis of 55000 hand tube-wells analyses from Bangladesh that in this area deep tubewells are usually very less arsenic contaminated.
- 5 Aware the villagers to use seasonal fruits and vegetables.
- 6 Arsenic committee should be formed involving arsenic affected youths who will actively take part in action plan.

## People involved in this work:

### School of Environmental Studies

Jadavpur University, Calcutta - 700 032, India

Mohammad Mahmudur Rahman (*Scientist*), Mrinal Kumar Sengupta (*Scientist*),  
Md. Amir Hossain (*Statistician*), Sad Ahamed (*Scientist*), Bhaskar Das (*Civil Engineer*),  
Dilip Lodh (*Computer Expert & Microbiologist*), Subhas Chandra Mukherjee (*Neurologist*),  
Dipankar Chakraborti (*Environmental Analytical Chemist and Environmentalist*).

### Dhaka Community Hospital

Bara Maghbazar, Wireless Rail Gate, Dhaka-1217, Bangladesh

Dr. Salim Morshed (*General Physician*), Dr. Tanzima Islam (*General Physician*),  
Dr. Farzana Bagum (*General Physician*), Md. Javed Yousuf (*Project Director*),  
Md. Golam Mostofa (*Program Officer*), Md. Ariful Islam (*Asst. Program Officer*),  
Md. Salim (*Field Attendant*), Sarker Sahid Atanu (*Field Attendant*), Sarker Shahed  
Santanu (*Field Attendant*), Prof. Quazi Quamruzzaman (*Pediatric Surgeon*).

## References

- 1 International conference, "Groundwater arsenic problem in Bangladesh: causes, effects and remedies", 6-9 February 1998, Dhaka, Bangladesh
- 2 Groundwater arsenic contamination in Bangladesh: (A) Summary of 239 days field survey from August 1995 to February 2000 (B) Twenty seven days detailed field survey information from April 1999 to February 2000", April 2000, School of Environmental Studies, Jadavpur University, Calcutta, India and Dhaka Community Hospital, Dhaka, Bangladesh